



4MG.035 Silicate Fibre

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Silicate fibre-based textiles have different thermal, physical and mechanical properties, depending upon their content of silicon dioxide (SiO₂). Silica is described as "pure" where its total content in a product exceeds 99.95 %; below this quantity, the product is described as "lixiviated silica" or "silicate". Final Advanced Materials supplies two silicate products, with a 98 % and 94 % SiO₂ content, for the effective fulfilment of all requirements.

Silicate fibre products are inorganic, and contain no toxic substances (asbestos-free) or irritants. The good thermal and mechanical properties of these products make them excellent replacements for asbestos-based products. With a diameter ranging from 6 to 9 µm, these fibres pose no hazard to health.

S98 products are comprised of over 98 % silica. They are suitable for high-temperature applications up to 1,200 °C.

S94 products contain over 94 % SiO₂, and function as excellent thermal insulators at temperatures up to 1,100 °C.

In comparative terms, silicate fibre-based textiles have superior high-temperature resistance to biosoluble fibre textiles.

Applications

- Insulation of industrial and electric furnaces
- Insulation of stacks
- Sealing gaskets
- Production of thermal protection systems
- Protection systems for molten metal projections

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General Characteristics

Thermal characteristics:

Silicate products have excellent resistance to thermal impacts, and remain stable in response to high temperatures. Their low thermal conductive and fire-resistance properties make these materials ideal insulators.

Mechanical characteristics:

Silicate fibre shows good mechanical resistance. These fibres remain extremely flexible, even at temperatures of the order of 1,000 °C.

Chemical characteristics:

An inorganic product, silicate fibre shows good chemical resistance and excellent stability in response to the vast majority of organic compounds, with the exception of hydrofluoric acid. This fibre is insensitive to mould and bacteria.

Electrical characteristics:

Silicate fibre is employed as an electrical insulator. It is also insensitive to radiation.

Benefits

- Antiseptic
- Non-combustible
- Excellent thermal resistance
- Excellent electrical insulation
- Good chemical stability
- Non-irritant
- Low shrinkage at high temperatures

Comparative Table

Properties	S98 silica	S94 silica	Biosoluble fibre
Chemical Composition	SiO ₂ : 98 % Other: 2 %	SiO ₂ : 94.5 % Al ₂ O ₃ : 4.5 % Na ₂ O: 0.5 % Other: 0.5 %	SiO ₂ : 63-67 % CaO: 29-33 % MgO: 1.5-4 % Al ₂ O ₃ : max 1 % Fe ₂ O ₃ : max 0.6 %
Color	Off-white	White	Light green
Average Diameter of Fibres	6 µm	9 µm	3.5 µm
Peak Temperature	1,200 °C	1,100 °C	650 °C (E-glass) 1,050 °C (Inconel®)
High-Temperature Stability	Very good	Excellent	Good
Thermal Impact Resistance	Excellent	Excellent	-
Resistance to Chemicals	Good	Good	Good
Mechanical Resistance	Good	Good	High (abrasion)
Flexibility	Good	Excellent	Good
Thermal Conductivity	Low	Low	Low
Response to Fire	Fire-resistant	Fire-resistant	Fire-resistant



Product range

Sleeves

Silicate fibre sleeves are fire-resistant, radiation-resistant, and have a low coefficient of thermal expansion, even at very high temperatures. Low in density, they show very good resistance to chemical agents, particularly to acids.

S98 sleeves are resistant in applications at temperatures up to 1,200 °C. They are principally employed as thermal or acoustic insulators, and for the reinforcement of composite materials. S94 sleeves are resistant to temperatures of 1,100 °C, and are excellent thermal insulators. They are ideal for the protection of cables and pipes against slags.

Properties	Units	S98	S94
Item n°		207-8501	207-7501
Diameter	mm	1 - 65	12 - 100
Length	m	25 - 200	25 - 50
Area Density	g/m ²	4 - 130	54 - 450
Operating Temperature	°C	1,050	1,000
Peak Temperature	°C	1,200	1,100

S94 products are only produced on request, and are subject to a minimum order quantity.

Fabrics

Silicate fibre fabrics are designed for the production of solutions for protection against the projection of metal and sparks. In addition to being excellent thermal and electrical insulators, these products are resistant to thermal impacts, and remain flexible, even in response to high thermal stresses.

S94 fabrics are designed for applications at temperatures up to 1,100 °C, whereas S98 fabrics are resistant to 1,200 °C.

Properties	Units	S98		S94	
Item n°		207-8101	207-8102	207-7101	207-7102
Area Density	g/m ²	640	1,250	500	1,000
Width	mm	910	910	1,000	1,000
Thickness	mm	0.7	1.3	1.8	2.6
Roll length	m	50	50	50	25
Operating Temp.	°C	1,050	1,050	1,000	1,000
Peak Temp.	°C	1,200	1,200	1,100	1,100

S94 products are only produced on request, and are subject to a minimum order quantity.

**Felts**

Silicate fibre felts contain no organic binder. The fibres are mechanically bonded, which makes the felt compact, flexible and gives it a good performance during its implementation.

S98 fibre felts are used in the shipbuilding and automotive industry as thermal and sound insulation and as a component for the manufacture of thermal and fire protection.

Propertie		Unit	S98
Item N°			207-8701
Density		kg/m ³	120-170
Width		mm	1,000
Thickness		mm	3 to 25
Coil Length		m	10 to 75
Operating Temperature		°C	1,000
Peak Temperature		°C	1,200
Thermal Conductivity (120 kg/m ³)	at 200 °C	W.m ⁻¹ .K ⁻¹	0.053
	at 400 °C		0.089
	at 600 °C		0.119
	at 800 °C		0.175
	at 1,000 °C		0.190

Twisted Ropes

Twisted ropes are composed of white silicate fibres. With a diameter of 9 µm, these fibres cause no irritation and are a safe and environmental-friendly alternative to ceramic fibres. These products contain over 94 % de SiO₂, and function as excellent thermal insulators at temperatures up to 1,100 °C. They are not subject to vitrification even with peaks at 1,200 °C. Their excellent flexibility and good mechanical resistance make these products particularly effective to protect pipes and cables.

Properties	Units	S94							
Section		Round							
Diameter	mm	3	4	5	6	8	10	12	
Length	m	200	150	100	100	100	100	100	

Other dimmensions are only produced on request

Braided Ropes

Silicate fibre braided cords are resistant to a continuous temperature of up to de 1,050 °C. They are not subject to vitrification, even at a temperature of 1,200 °C. Their excellent flexibility and good mechanical resistance make these products particularly effective insulating seals. Braided cords are available in square or round sections.

**Silicate Fibre**

Properties	Units	S98	S98	S94	S94
Item n°		207-8301	207-8302	207-7301	207-7302
Section		Round	Square	Round	Square
Diameter	mm	3 - 25	3x3 - 25x25	5 - 80	5x5 - 100x100
Length	m	30 - 100	30 - 100	10 - 100	10 - 100
Operating temperature	°C	1,050	1,050	1,000	1,000
Peak temperature	°C	1,200	1,200	1,100	1,100

S94 products are only produced on request, and are subject to a minimum order quantity.

Tapes

Silicate fibre tapes are excellent thermal insulators. These narrow strip textiles are resistant to temperatures up to 1,200 °C, in the case of S98 products, and up to 1,100 °C in the case of S94 products. They are used for the protection of cables and pipes, and are available in adhesive and stud bushing versions for ease of application.

Properties	Units	S98	S94
Item n°		207-8201	207-7201
Thickness	mm	0.7	2 - 5
Width	mm	10 - 50	20 - 300
Length	m	50	25 - 50
Operating temperature	°C	1,050	1,000
Peak temperature	°C	1,200	1,100

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Physical variables included in this documentation are provided by way of indication only and do not, under any circumstances, constitute a contractual undertaking. Please contact our technical service if you require any additional information.